General Comments
Possible Next Steps/Issues to Consider for the Conceptual Sediment Basin/Wetland System
Presented by Brown and Caldwell (11/9/99)

Dave Ferguson, Soil Conservation Commission, Boise, ID

- Recommends that ponds be shaped differently.
  - Long and narrow, to allow for a 4 or 5 to 1 length to width, and which would allow for maintenance by a track hoe or drag line to clean the pond from each side.
  - No need to concrete line these ponds.
  - I don't recommend baffles either, as long as there is adequate space for storage capacity.

- Design each Sediment Basin (2) with a rectangular shape.
  - Approx. 600 ft long by 50ft wide, at 2 ft of depth (option: 550 x 50 with a depth at 4 ft).
  - This would have the storage capacity for 1/2 the predicted load (1,150 cubic yards).
  - One point of concern is that sediment concentrations in the spring-summer may be greater than the later summer-fall concentrations.
  - If one basin would filter water the first 100 days, it may need sized differently than the basin filtering water the second 100 because of sediment concentration differences.

Ralph Rogers, Regional Wetland Ecologist, USEPA Region 10, Seattle, WA

- What about opportunities for wetland “swales” downstream of the retention ponds?

- Soils - Ultimately will need to do on-site evaluation to assess the soils in the area.

  - As stated on page 2 of the technical memorandum, “Finally, most of the soils at the site are classified as sandy-silty loams, which are less desirable for wetland creation and may require soil amendments to facilitate plant growth”. *Could the upper layer be salvaged and replaced after excavation?*

- Any hydraulic soils mapped for project area? Inclusions?

- Wetlands
  - An on the ground assessment needs to be done to assess the potential for existing wetlands.
- Flooding – Acquire better data on flood storage function of site under existing conditions.
  - An on the ground assessment needs to be done to assess the potential for flooding and the existence of wetlands.
  - Research flood data for Lower Boise River and FEMA maps for the Lower Boise River.
  - What intensity of flooding was assessed?
  - Berm heights could be higher or lower based on flood data.

- Maintenance and Operation
  - Describe the general maintenance (and perhaps monitoring) needs of both types of systems.
  - Need discussion of maintenance requirements/schedule including basis for methods and timing of maintenance, activities, especially justification for plant removal interval of 5 years.
  - As stated in the technical memorandum, "The system is designed to be operated with minimal flows during off-season. This will help keep plants alive and minimize decay, which can lead to the remobilization of phosphorus", *what about off-season maintenance? Or will facility be operated year round—in which case plant uptake ability will vary with season?*
  - How does the plant harvest affects biomass accumulation, thus the life of the system?
  - How will temperature variations affect the plants (i.e., growing season versus dormancy)?

- Are there fish passage issues?

Eric Stiles, US Bureau of Reclamation, Denver, CO *– Please note that these comments are based on a very cursory review of the draft materials I have, and it is apparent that a good proportion of these comments could probably be clarified through some further discussion.*

- Concept plan as a model trade

- At this point, this is really the main objective for developing the concept design example.
- A question is raised, “are the design features and estimated costs an accurate representation of a “typical” wetlands facility at this site?
- How representative would these design features be for other locations or circumstances expected in the Lower Boise River basin?
- Possible references might include costs for simple to complex facilities, other types of treatment systems (e.g., Lemna), and consideration for the factors in play at other sites in the area.

- Site plan layout and water control features
  - There are a number of areas that I might suggest other considerations (some of this is personal preference).
  - Most items could be discussed later in further stages of design development to actually undertake a project at this site. The following is a list of thoughts:
    - It appears that some of the water controls could be simplified and still meet functionality.
    - Intake diversion is critical to intercept flow, but not bed load, and to minimize flood damage.
    - Suggest modified segment pond configuration to enhance sedimentation, and make easier to maintain.
    - Layout of ponds in sequence for flexible operations, and to reduce the management of areas in downstream floodplain.
- Wetland treatment design strategies.
  - Characterization of constructed treatment wetlands as even depth and grades is not accurate. Nearly all full-scale wetlands have a good deal of diversity, and may include the concept of functional compartments.
  - More to the point, is what functions, or compartments, or features are best suited to address these conditions, and are most representative of model trade goals.
- Treatment process factors. This was not reviewed in detail. The following is a list of my comments and questions:
  - Wetlands consumptive ET loss is near 80% pan evaporation is typical cfor wetlands depending on wetland and site factors.
  - Wetland trade would not be designed to address storm flows, in fact it would need to resist damage as much as possible.
  - Was the TP removal separated into sediment pond and wetlands or is the total combined?

- It was difficult to review Kadlec and Knight rate function analysis due to different conversion terms, and uncertain equations.
- There are some other considerations regarding Kadlec and Knight rate functions that might be worthwhile in further design development.
- The total annual mass reduction is given, but the design flow rate and seasonal capture assumptions are not so clear.

Ultimately, it seems clear that this strategy would have to be applied initially as a measured trade, due to the uncertainties regarding the actual phosphorus removal under these conditions. It is also clear, however, that as a default, the performance of a sediment pond provides a minimal baseline performance expectation.